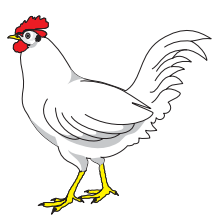
Science Update

Chicken-Feathered Industrial Products

With over 9 billion chickens raised for food annually in the United States alone, the industry generates enormous quantities of feathers. Researchers have been searching for new uses for this vast resource, solving a serious waste-disposal problem while putting money into processors' hands. They have already found a way to turn chicken feathers into strong, less dense plastic composites for products as varied as car dashboards and boat exteriors. Feathers make good paper, too, even for filters or decorative wallpaper. They work best combined with wood pulp to increase the number of times the fiber can be recycled.



The superfine size and shape of feathers make them particularly well suited to filtration needs. Most filters are now made from wood pulp fiber, which can screen out particles as small as 10-20 microns. Those made from feather fiber can screen out 5-micron particles, thus catching and trapping even more spores, dust, and dander. The fine filtration that feather filters could provide would be a boon in the homes and offices of those with allergies or asthma.

Already patented, the technology has been licensed to three companies, with two pilot plants already turning feathers into fiber. *Walter F. Schmidt, USDA-ARS Environmental Quality Laboratory, Beltsville, Maryland; phone (301) 504-6765, e-mail schmidtw@ba.ars.usda.gov.*

Test for Potentially Toxic Algae

Aquaculture producers may breathe a little easier thanks to a new method for detecting genetic material that algae need to produce fish-killing toxins called microcystins. The freshwater blue-green alga known as *Microcystis aeruginosa* normally produces oxygen needed for fish respiration and removes potentially toxic chemicals from the water. But some strains can produce toxins that sicken or kill fish.

Researchers sampled water from nearly 500 catfish farms in Alabama, Arkansas, Louisiana, and Mississippi over 11 days in 2000. The data showed that while 31 percent of the ponds contained algae with the genetic potential to produce toxins, less than 1 percent had concentrations above the international safe drinking water standard. Now the scientists have developed a polymerase chain reaction test for detecting the gene sequence the alga needs to produce the toxins. It should be an easy, inexpensive way for aquaculturists to minimize the potential for fish kills. It could also be useful for detecting the presence of algal toxins in municipal drinking water. *Paul V. Zimba, USDA-ARS Catfish Genetics Research Unit, Stoneville, Mississippi; phone (662) 686-3588, e-mail pzimba@ars.usda.gov.*

Perilipin May Predict Heart Attack or Stroke

A protein that helps body cells store fat may one day help doctors assess whether patients whose blood vessels contain fatty deposits called plaque are at risk for a heart attack or stroke. Research has shown that perilipin is more actively synthesized in ruptured, rather than stable, plaque. When plaque ruptures, it triggers formation of an internal plug that can stop blood flow in the artery—or reduce it to a trickle. Ruptured plaque in the heart can cause a heart attack. If it occurs in the head or neck, it can cause a stroke.

Researchers cloned genes from ruptured and nonruptured plaque and looked for differences in expression among the genes. They found good evidence that the perilipin gene turned on and expressed the protein in the ruptured plaques, but that it was hard to detect in stable plaques. Further research may lead to a test for the presence and amount of perilipin, to detect plaque that is in danger of rupturing. A perilipin antibody attached to the protein could be tagged with a radioactive tracer and viewed with imaging technology. This would help in monitoring the effectiveness of nutritional interventions—for example, of folate or antioxidants—on risk for heart attack or stroke. If scientists can better understand how plaques become unstable, they may find preventive measures. *Andrew S. Greenberg, USDA-ARS Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts; phone (617) 556-3144, e-mail agreenberg@hnrc.tufts.edu.*

Getting More Out of Corn—More Economically

After 100 years of doing it the same way, corn refiners will soon have another option that can potentially lower costs and shorten the time needed to produce starch, oil, and other co-products. In laboratory and pilot-scale trials, this new method yields as much or more starch as the conventional process.

Relying on protease enzymes to break down starch and protein and using less sulfur dioxide, the method requires just a 6-hour pretreatment of corn kernels before milling. This replaces the 24 to 36 hours of conventional steeping in water and sulfur dioxide that customarily start the breakdown process. Researchers have applied for a patent on the method. *David B. Johnston, USDA-ARS Crop Conversion Science and Engineering Research Unit, Wyndmoor, Pennsylvania; phone (215) 836-3756, e-mail djohnston@arserc.gov.*